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Udo Merker

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EXAMINER

NGUYEN, KHANH TUAN

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

09/28/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,527	Applicant(s) MERKER ET AL.	
	Examiner KHANH T. NGUYEN	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09/01/2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-11, 13, 14, 76 and 77 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-11, 13, 14 and 77 is/are rejected.
- 7) ☒ Claim(s) 76 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>none</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment filed on 09/01/2010 is entered and acknowledged by the Examiner. Claims 2-11, 13, 14, and new added claims 76-77 are currently pending in the instant application. Claims 1, 12, and 15-75 are cancelled.
2. The rejection of claim 14 under 35 U.S.C. 112, second paragraph, as being indefinite is rendered moot in view of the above amendment.
3. The rejection of claims 2-8, 11, 13, and 14 under 35 U.S.C. 102(b) as being unpatentable over U.S. Pat. 5,986,046 (Nishiyama) withdrawn in view of the applicant's remark and above amendment.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 77 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and

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distinctly claim the subject matter which applicant regards as the invention.

Claim 77 recites the limitation "solvent" in line. There is insufficient antecedent basis for this limitation in the claim. Claim 77 depends from claim 76, which depends from claim 14, however claims 76 and 14 does not recite a solvent. Thus, there is a lacks of antecedent basis for this limitation.

Claim Rejections - 35 USC § 103

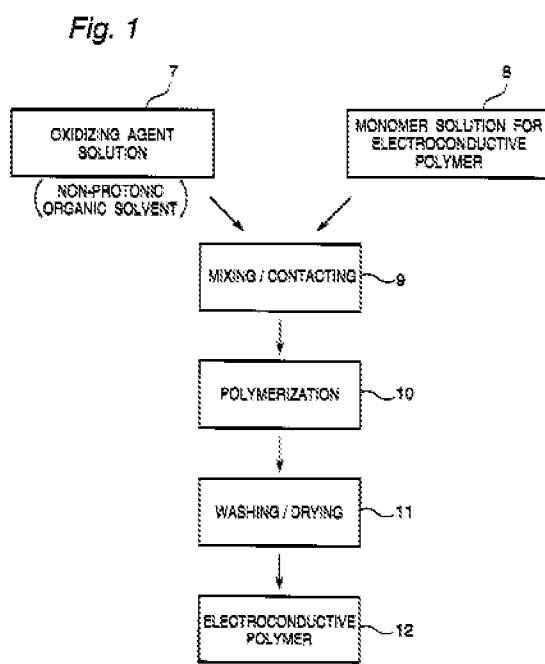
5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. **Claims 2-8, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. 5,986,046 (Nishiyama) in view of JP 63-023933 (hereinafter refer to as Sada).** (Note that, a full English translation of the Sada reference will be provided to the applicant shortly.)

Nishiyama discloses a method for preparing electroconductive polymers such as polythiophene derivative polymers (Col. 4, lines 23-30) wherein an oxidizing agent solution, i.e. step 7, is prepared and a monomer (precursor) solution of electroconductive polymer is prepared, i.e. step 8, before contacting the oxidizing solution with the monomer solution to form the electroconductive polymer, i.e. steps 9 to

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12 (Col. 5, lines 1-12; Fig. 1). Nishiyama suggest a step of mixing the oxidant (oxidizing agent solution) with at least one precursor (monomer solution for electroconductive polymer) for preparing at least one conductive polymer as required in **claim 14**.



In one embodiment, Nishiyama discloses that the oxidant solution can be prepared by introducing an iron (III) ion as an oxidant, into a non-protonic organic solvent, such as acetonitrile, dissolving a high concentration of a derivative of aromatic sulfonic acid having, as a substituting group, at least one of the OH group and the COOH group which is an acidic group (Col. 3, lines 59-65). The non-protonic organic solvent, e.g.

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acetonitrile, of Nishiyama fulfills the claimed required of the process is carried out in the presence of one or more solvent as required in **claim 8**. In one example, Nishiyama used Fe^{3+} /5-sulfosalicylic acid/p-phenolsulfonic acid as the iron salt to prepare the oxidant solution (Col. 6, lines 50-55). The instant step fulfills the claimed step of providing a metal salt of organic acid or an inorganic acid having organic radicals. The Fe^{3+} /5-sulfosalicylic acid/p-phenolsulfonic acid salt of Nishiyama fulfills the claimed iron(III) salt of **claims 4, 5, and 7** having a sulfonic acid radical of **claim 6**. **Claim 13** requires the oxidant presented in a solution and the solution has a water content that includes 0 wt.% based on the total weight of the solution, thus the water content is construed as an optional, non-essential, component and need not be disclosed or suggested by Nishiyama. Nishiyama further suggest, at step 11, the steps of washing, filtering, and drying the solution, i.e. oxidant containing solution, to remove the solvent (Col. 5, lines 19-20; Col. Fig. 1). Step 11 of Nishiyama inherently separates the from solvent after the treatment with the ion exchanger as required in **claim 11**. It should be noted that the optional limitation of redissolving the oxidant in the same solvent or another solvent as recited in claim 11 need not be

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disclosed or suggested by Nishiyama since the instant step is optional.

Nishiyama failed to suggest a process for oxidative polymerization of precursors for the preparation of conductive polymers comprising a step of preparing an oxidant by contacting a metal salt with an ion exchanger as required in claim 2, 3 and 14.

In an analogous art of oxidative polymerization of precursors for the preparation of conductive polymers such as thiophene, Sada discloses a method preparing a conductive polymer by polymerizing an oxidative polymerizable monomer such thiophene and pyrrole in an ion exchanger containing an oxidizing agent such s metal salt, e.g. FeCl_3 (See Abstract). Sada discloses that the ion exchanger can be organic or inorganic (See Abstract), which is considered to encompass the ion exchanger of **claims 2 and 3**.

It would have been obvious for a person having an ordinary skill in the art at the time the invention was made to prepare the conductive polymer by using an ion exchanger-containing oxidizing agent of Sada to form the oxidizing agent solution of Nishiyama. The solution of ion exchanger-containing oxidizing agent fulfills the claimed step of preparing an oxidant by

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containing the metal salt with an ion exchanger as required in **claim 14**. A person of ordinary skill in the art would be motivated to use the ion exchanger-containing oxidizing agent of Sada in the oxidizing agent solution of Nishiyama in order to provide ionic permeability (See Abstract of Sada).

7. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. 5,986,046 (Nishiyama) in view of JP 63-023933 (Sada) as applied to the above claims, and further in view of U.S. Pat. 4,910,645 (Jonas).

Nishiyama and Sada are relied upon as set forth above.

Regarding **claim 9**, Nishiyama discloses a method of preparing electroconductive polymer by oxidation polymerization process (Col. 1, lines 10-15). Nishiyama discloses the electroconductive polymer including polythiophene derivative (Col. 3, line 27). Nishiyama discloses the method including a iron(III) salt and a non-protonic organic solvent, such as acetonitrile, but failed to disclose the solvent or solvents used is/are one or more alcohol(s), water or a mixture of one or more alcohol(s) and water as required by the instant claim.

However, Jonas discloses a conductive polymer such as polythiophene can be obtained by oxidative polymerization (Col. 1, lines 31-33). Jonas discloses the oxidative polymerization of

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s3,4-dialkoxythiophene (polymer precursor) and/or oxidant are in solvents including aliphatic alcohols such as methanol, ethanol, and i-propanol; aliphatic nitrile such as acetonitrile; and a mixture of water and said solvents (Col. 2, lines 37-59). Jonas also discloses an oxidant such as iron(III) salt of organic acids and of inorganic acids containing organic radicals (Col. 3, lines 10-11). Jonas discloses the solution of oxidant and the solution of monomer (3,4-dialkoxythiophene) are applied separately (Col. 3, lines 45-49).

Nishiyama and Sada are combined with Jonas because they suggest a method of preparing polythiophene derivative polymer by oxidation polymerization that involves a solution of iron(III) salt (oxidant solution) and a solution of monomer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Nishiyama by substituting the acetonitrile solvent of Nishiyama with the alcohol solvent of Jonas and the result would have been predictable since Jonas discloses acetonitrile solvent or alcohol solvent can be used to prepare the oxidant solution (Col. 2, lines 42-59). Therefore, the substitution of acetonitrile solvent for alcohol solvent in the method of

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Nishiyama would have been obvious. The burden is upon the applicant to prove otherwise. *In re Fitzgerald*, 205 USPQ 594.

Regarding **claim 10**, Jones discloses the alcohol solvent is selected from a group including methanol and ethanol as required by the instant claim (Col. 2, lines 45-46).

In view of the foregoing, the above claims have failed to patentably distinguish over the applied art.

Allowable Subject Matter

8. Claims 76 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Currently there is no prior art alone or in combination that teach or suggest a process for oxidative polymerization of precursors for the preparation of conductive polymers comprising a step of separating the ion exchanger from the oxidant before mixing the oxidant with at least one conductive polymer precursor as required in **claim 76**.

Claim 77 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Claim 77 depend from claim 76 and would be allowable for the same reason therein.

Response to Arguments

9. Applicant's arguments with respect to the claims above have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHANH T. NGUYEN whose telephone number is (571)272-8082. The examiner can normally be reached on Monday-Thursday 7:00-6:00 EST PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Khanh Tuan Nguyen/
Examiner, Art Unit 1796